Evolution of the United States; "Development of Mechanical Inventions in the United States," *Harper's Magazine*, Vol. L, p. 67. (For a complete reference list on this course see ELEMENTARY SCHOOL TEACHER, April, 1902.)

COURSE IV. HISTORY FOR PRIMARY GRADES.

I. Observation of present industries.

House-building, brick-making, preparation of lumber for house-building, weaving, sewing, gardening, farming, transportation, baking, dairying, milling, packing, pottery-making, iron-working. Selection of industries dependent on environment.

Schoolroom work related to these industries: reading, writing, modeling, drawing, making.

Literature.—Myths and fairy tales connected with these industries, or told irrespective of such connection. Tales of inventors and other workers.

REFERENCES: Viollet-le-Duc, *Story of a House;* Binns, *Story of the Potter;* Rock, *Textile Fabrics;* Chase and Clow, *Stories of Industry;* King, *The Land We Live In*, Part I; "Textile Art in its Relation to Development of Form and Ornament," *North American Ethnology* (House Miscellaneous Reports, 1887–88).

II. Questioning of the necessity back of the industries observed.

Dramatization of the conditions which compelled their discovery. Hunter life: food, weapons, dwelling, clothing, fire, cave dwellers. Shepherd life: domestication and care of animals, pottery, weaving, customs; stories of Hebrew shepherds, of Arabs, of modern types in Palestine. Beginnings of tillage; discovery of seed propagation; feeding of animals. Arts and customs dependent on fixed habitation: Pueblo dwellers, navigation; invention of boats, lake dwellers, Viking stories.

Literature.—Waterloo, *Story of Ab;* Josephus, *Abraham;* the Bible, "Joseph and his brethren;" Browning, "Muléy keh;" Lamartine, "Palissy," *Memoirs of Celebrated Characters;* X. B. Saintine, *Picciola;* "Ceres and Persephone," "Montezuma;" Hall, *West-Over-Seas, Four Old Greeks;* Longfellow, "The Crew of the Long Serpent."

REFERENCES: Joly, *Man before Metals;* Viollet-le-Duc, *Homes and Habitations of Man in All Ages;* Figuier, *Primitive Man;* Mason, *Origin of Inventions, Woman's Share in Primitive Culture;* Morgan, *Houses and House Life;* Doughty, *Arabia Deserta;* Starr, *Some First Steps in Human Progress;* Parker, *Fleets of the World;* Sven Hedin, *Through Asia;* Keller, *The Lake Dwellers.*

GEOGRAPHY.

ZONIA BABER.

I. THE basis of a curriculum for elementary schools is found in the needs of society.

1. How the individual is educated: through the home, nature, the school, society, business, government: (*a*) part accomplished by each; (*b*) entrance into the work of every institution essential to the appreciation of the spirit of the institution.

2. Institutions seek to perpetuate themselves for their own sake, not for the sake of the individual: (*a*) compare European homes of mediæval times with homes of today; compare schools of mediæval times with schools of today; (*b*) individual adaptation to changing institutions; (*c*) effect of centralization of industries upon individual education; (*d*) effect of centralization of government upon individual education; (*e*) effect of city aggregation upon the education of the individual; (*f*) effect of isolation from nature upon the education of the individual.

II. Motive in all action: in the home; in the school; in society; in business; in relation to nature.

1. Effect of motiveless action.

2. Difference between the motive of the teacher and that of the pupil in school work.

3. Effect of school work for which a motive must be invented.

4. The child's motive for the study of reading, writing, history, geography, nature study, drawing, modeling, making, etc. The teacher's motive.

5. Changes necessary to the formation of a school in which each pupil may have normal self-expression.

6. Should the school enter the commercial world? Advantages, disadvantages.

III. Is the study of geography a social need?

1. Necessity of the intelligent enlargement of a sympathy for the peoples of the world.

2. Necessity for an intelligent appreciation of natural phenomena in relation to individuals and nations.

3. Curriculum in geography for elementary schools: (*a*) basis of choice of subjects; (*b*) what aspects of the subject can pupils really enter into?

COURSE FOR PRIMARY GRADES.

Normal interests of pupils from six to twelve years of age in the home, in society, in business, in government, in the school, in nature.

I. The home.

1. Shelter. Manner of construction: (*a*) tent—Arabia, Mongolia, India; (*b*) grass house—Java, Yucatan, Cuba, Hawaii; (*c*) snow—Greenland; (*d*) stone, visit to quarry; (*e*) brick, visit brick kiln at Purington; (*f*) lumber, manner of obtaining lumber, lumbering in Michigan, compare with similar industry in Burma.

2. Lighting: (*a*) oil, vegetable and animal; candles, gas, electricity; (*b*) how obtained? visit gas and electric plants.

3. Heating and cooling the home. Heating: (*a*) brazier—Mexico, Japan; (*b*) kang—Corea, China; (*c*) stove—America, Germany; (*d*) furnace—America; (*e*) Yaryan system. Cooling: punka—India. Fuel: (*a*) location; manner of obtaining wood, charcoal, coal, coke, gas, oil.

4. Water: (*a*) rain—cisterns; where used; (*b*) underground—source; wells—manner of digging; (*c*) rivers, lakes; (*d*) means of lifting water from wells, rivers, lakes; sweep (shaduf)—Egypt; sequiya—Egypt and Yucatan; pump—visit one of the city pumping stations; (*e*) water carriers in Egypt, India, Mexico; (*f*) conditions which favor the use of wells, rivers, lakes, cisterns.

5. Food. Source: how obtained—hunting, fishing, agriculture, grazing, manufacture. (1) Hunting—in mountains and plains in cold, temperate, and hot regions; Eskimos a type of peoples who live by hunting. (2) Fishing on Lake Michigan; cod-fishing on Atlantic coast; fishing in Norway and Japan. (3) Agriculture: (*a*) type of farming in Illinois, Egypt, Java; (*b*) products we use from an Illinois farm—wheat, corn, oats, fruits: means of cultivation; (*c*) products we use from a tropic farm: rice—Java; sugar—Cuba; tea—Ceylon; coffee—Brazil; cocoa—Mexico; tapioca—Jamaica; tropic fruits: oranges, pineapples—Florida; bananas—Hondurus; how grown? transported? (4) Agriculture: soil; moisture; heat; drainage: (*a*) soil—sand, gravel, clay, loam, humus; experiment showing effect on growth of vegetation (see "Natural Science"); (*b*) moisture—experiments showing moisture relation to plants (see "Natural Science"); India, Sahara, Illinois; (*c*) heat relation to vegetation; experiments (see "Natural Science"); effect in Jamaica, Illinois, Greenland; (*d*) drainage—river, ditch, tile; slope—angle of condemnation in Himalayas; (*e*) destructive agents—frost, wind, drought, floods, animals, other plants; means of protecting against each. (5) Grazing: animal products from grazing areas. (6) Preparation and cooking of food: a Japanese dinner, Chinese dinner, Arab dinner, Mexican dinner.

6. Clothing: (*a*) source and manner of production of cotton, flax, silk, fur, wool, hair, leather (see "Textiles"); (*b*) jewelry—mining gold, silver, precious stones.

II. Nature: Industrial and æsthetic aspects. Genesis of geographic forms.

1. Lakes: Lake Michigan's contribution to Chicago; study lakeshore; (*a*) drinking water, manner of obtaining; (*b*) fishing; (*c*) commerce—grain, iron, lumber, food, and manufactured products; (*d*) work of waves, wind, and littoral currents along the lakeshore—cliffs, bars, spits, dunes; study cliff-making along the north shore, and dunes along south shore; reproduce similar forms in laboratory; (*e*) harbors along coast; means of maintaining good harbors; (*f*) light-houses and life-saving stations; visit station.

REFERENCES: Salisbury and Alden, *Geography of Chicago and its Environs;* Shaler, *Beaches and Tide Marshes;* Davis, *Physical Geography;* Tarr, *Physical Geography;* Russell, *Lakes of North America.* For outline on rivers, glaciers, wind, see ELEMENTARY SCHOOL TEACHER, Vol. II, No. 1, pp. 50–53. See also "History," syllabus of Course 2, in this number.

COURSE FOR GRAMMAR GRADES.

The curriculum (see "Course for Primary Grades"). Interests of children from ten to fourteen years in nature, society, government, industries, current events. Present commercial movement a world-uniting interest. A knowledge of the world's geography an essential.

THE WORLD AS A WHOLE.

I. Distribution of land masses.

1. Western land mass one continental area. (1) Western highlands: Rocky Mountains, Sierra Madre, Central American mountains, Andes mountains: (*a*) general characteristics — volcanoes, plateaux, mountain ranges; (*b*) effect on the remainder of the continent; (*c*) mountain industries. (2) Central plain in North and South America; depressed in Gulf of Mexico and Caribbean sea: (*a*) effect of the central plain on the remainder of the continent; (*b*) indigenous vegetation of the central plain; (*c*) industries developed in consequence of the plain; (*d*) effect of the depression of the plain in the Gulf of Mexico and Caribbean sea; (*e*) would it be to the advantage or disadvantage of the continent if the American Mediterranean should become land? (*f*) would it be advantageous to the continent, or otherwise, if the American Mediterranean pierced the continent? (*g*) What are the location advantages, or disadvantages, of the West Indies? Could they have a more advantageous location than they have? (3) Eastern highland: Canadian, Appalachian, Guiana, Brazilian: (*a*) characteristics; value to continent; effect on development. (4) Distribution of river systems; effect on the development of civilization. (5) Coastal plains. (6) Climate — distribution of heat, prevailing winds, distribution of rainfall. (7) Distribution of forests, prairies, deserts. (8) Distribution of industries — farming, mining, grazing, fishing, hunting, lumbering, manufacturing. (9) Distribution of cities; account for location. (10) Distribution of governments; cause for national divisions.

REFERENCES: Mill, *International Geography; Compendium of North America; South America;* Reclus, *Earth and its Inhabitants;* Shaler, *The United States of America; Our Continent; Man and Nature in America; National Geographic Monographs;* Russel, *Rivers of North America; Lakes of North America; Volcanoes of North America;* Carpenter, *South America, Social, Industrial, and Political;* Adams, *Commercial Geography.* For a special study of North America see ELEMENTARY SCHOOL TEACHER, Vol. II, No. 1, p. 51.

2. The eastern land mass of Eurasia and Africa considered as one continent. (1) Highlands extending from Kamtchatka through southern Asia and eastern Africa; characteristics of mountains and plateaux. (2) Great plain extending through northern Asia and Europe, central and western Africa, interrupted by mountains of southern Europe, North Africa, Scandinavia: (*a*) have the plains and highlands the best relative position for the development of the continent? (*b*) advantageous changes. (3) Climate — distribution of heat, rainfall, prevailing winds. (4) Distribution of river basins. (5) Distribution of forests, prairies, deserts. (6) Distribution of governments; account for it. (7) Distribution of large cities; account for location.

REFERENCES: Mill, *International Geography; Asia, Europe, Africa*, "Compendium;" Mill, *Realm of Nature;* Reclus, "Asia," "Europe," "Africa," *Earth and its Inhabitants;* Sven Hedin, *Through Asia.* For a special study of Eurasia see ELEMENTARY SCHOOL TEACHER, Vol. II, No. 1, p. 53.

3. Islands of the world: Location. Areas where islands are numerous; where islands are few. (1) Continental islands located. (2) Oceanic island: Formation: (A) Volcanic: (*a*) location — relation of continental volcanic regions to location of volcanic islands; (*b*) special study of Martinique and other volcanic West Indies, Hawaii, Krakatoa; appearance — rock, different kinds of lavas, ashes; vegetating new lava flows. (B) Coral: (*a*) conditions for coral growth; (*b*) location of coral island and reef; (*c*) special study of Bermuda Islands. (3) Division of control of islands among great nations of the earth: (*a*) use of islands as promoters of maritime enterprises; (*b*) the advantage or disadvantage to the United States of control of West Indies.

REFERENCES: Islands: Reclus, *New Physical Geography: The Ocean; Oceanic.*

Hawaii: Dutton, *Hawaiian Volcanoes; United States Geological Survey, Fourth Annual Report*, 1882–8; Wallace, *Island Life;* Alexander, *Islands of the Pacific;* Dana, *Characteristic Volcanoes;* Mrs. J. S. Bishop, *Hawaiian Archipelago;* Maxwell, *Lavas and Soils of Hawaii;* Judd, *Volcanoes;* Hull, *Volcanoes.*

West Indies: Hill, *Cuba, Jamaica, and Porto Rico, with Other Islands of the West Indies;* Hill, "Geology of Cuba," *Bulletin*, Vol. XVI, No. 15, Museum of Comparative Zoölogy, Cambridge; Hill, "Geology of Jamaica," Vol. XXXIV, *ibid.;* Hearn, *Two Years in the West Indies;* Paton, *Down the Islands;* Kingsley, *Westward Ho!* and *At Last;* Agassiz, *Three Cruises of the Blake; National Geographic Magazine*, May, 1898; Reclus, "North America," *The Earth and Its Inhabitants;* Stanford, *Compendium;* Agassiz, *Florida Reefs;* Agassiz, *Cruise of the Wild Duck.*

Coral and coral islands: Dana, *Distribution of Coral Reefs;* Darwin, *Bermuda;* Agassiz, *A Visit to the Bermudas in March, 1894; Bulletin*, Museum of Comparative Zoölogy, Vol. XXVI, No. 2; Heilprin, *The Bermuda Islands;* Thomson, *Atlantic*, I; Rice, *National Bulletin*, No. 25; Jones, *Naturalist in the Burmudas, 1859; Voyage of H. M. S. Challenger*, Part I; Mill, *International Geography.*

II. Distribution of sunshine.

1. Change of place and time of sunrise, sunset; cause of variation in length of day here.

2. Regions of earth where night and day have least change.

3. Regions of greatest changes.

4. Apparent meridianal movement of sun; difference in amount of sunshine received in same number of hours in summer and in winter.

5. Movements of isothermal equator: (*a*) movement of isotherm of 32° —northern and southern hemisphere; (*b*) movement of isotherms 60°–70° in northern and southern hemisphere; (*c*) effect of oceans, mountains, and plains on isotherms; (*d*) a knowledge of mathematical geography an essential in imaging continental landscapes.

REFERENCES: Jackson, *Astronomical Geography;* Newcombs, *Popular Astronomy;* Huxley, *Physiography;* Gregory, *Elements of Physiography.*

III. Winds and rainfall.

1. Prevailing winds of this region.

2. Cause of winds: effect of temperature, moisture; barometric pressure; velocity of winds — cause.

3. Study of United States weather maps; changes in regions of "high" pressure; of "low" pressure; movements of storm centers; tornadoes.

4. Terrestrial winds: cause; direction of movement; velocity: (*a*) trade winds — change; regions affected; (*b*) westerlies — changes; (*c*) monsoons — cause, regions affected.

5. Relation of winds to distribution of life.

6. Regions of greatest rainfall: (*a*) relation of rainfall to the prevailing wind; (*b*) relation of rainfall to latitude, altitude; (*c*) relation of rainfall to topography; (*d*) regions of least rainfall — cause; regions of moderate rainfall — cause.

IV. Ocean currents.

1. Cause; position in oceans.

2. Effect on continents.

3. Relation to winds, temperature, rainfall, fogs.

4. Relation to distribution of life.

V. Distribution of vegetation.

1. Relation to rainfall and heat: (*a*) distribution of forests — cause; (*b*) distribution of prairies — cause; (*c*) distribution of deserts — cause.

2. Relation of vegetal distribution to civilization.

REFERENCES: Winds: Davis, *Elementary Meteorology; Physical Geography;* Ferrel, *Popular Treatise on Winds;* Waldo, *Elementary Meteorology;* Geikie, *Physical Geography;* Archibald, *The Story of the Atmosphere;* Gregory, *Elements of Physiography.*

Ocean currents: Reclus, *The Ocean.*

VI. Distribution of man.

Relation of history to geography. (See COURSE OF STUDY [Chicago Institute], Vol. I, No. 1.)

FIELD WORK.

The second term will be devoted to field work in geography and nature study in selected regions in Illinois, Iowa, and Wisconsin. The work will include a study of the topography and genesis of the regions visited; also a study of the industries and the plant and animal life as determined by this topography. The field work will be in charge of Miss Baber and Mr. I. B. Meyers. In case Mr. Meyers should not be able to go, a substitute will be provided.

MATHEMATICS.

COURSE I. APPLIED ARITHMETIC.

(Laboratory course.)

GERTRUDE VAN HOESEN.

THIS course has been planned with the year's work as a basis. When the data have been obtained, the work will be considered from the standpoint of adaptation to grade. In order to do this, special attention will be given to the teaching of the fundamental operations, fractions, decimals, and percentage, wherever the work demands their use.

SOILS.

I. Classification in relation to locality, *i. e.*, garden, farm, swamp, forest, or lakeshore. (1) Examination as to mechanical constituents. (2) Examination as to properties: (*a*) percolation of water; (*b*) capacity to prevent evaporation; (*c*) capillarity; (*d*) inference in regard to the percentage of the different constituents in the various soils. (3) The relation of the earthworms to good soil. (4) Examination of soils in regard to physical constituents.

II. Examination of plants from the different localities. (1) Does the difference in soil affect the constituents or growth of the plants? (2) Comparison of plants from the different areas as to roots, stem, and leaves.

WATER.

The relation of moisture to plant life. (1) Proof that plants absorb water. (2) Relation of the amount of water absorbed to the amount transpired. (3) Relation of the amount transpired to the leaf area. (4) Estimate the amount of water transpired from a small tree. (5) How much water has the tree at its disposal? (*a*) Find the volume of soil within reach of the roots. (*b*) Estimate the amount of water in this soil. (6) Effect of transpiration from land covered with forests. (7) Study of evaporation. What affects the